

ROLES AND RESPONSIBILITIES OF PROJECT PARTICIPANTS AS A
DETERMINANT OF RISK MITIGATION FOR INJURY ON
CONSTRUCTION SITES

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ABSTRACT

This research paper will focus on indentifying and evaluating the significance of roles and responsibilities of project participants as a determinant of risk mitigation for injury on construction sites. Subsequently proposal for developing our very own version of Building and Construction Classification System while establishing a Construction Risk Management framework that integrate the association of hierarchical levels of project participants and authorities will be recommended. In addition to that, several suggestions will be aligned to complement the proposals in facilitating the efforts of improving workplace safety on construction sites. Such modelling of approaches are intended to fill a theoretical gap in our understanding levels on how significant roles and responsibilities of project participants as a determinant of risk mitigation to casualties on construction sites. Consequences of these actions are targeted to emphasize the importance of the top three significance roles and responsibilities of project participants obtained from this research where all three are consultant-oriented – completeness of information, responsibility of inspection and corrective actions and timely transmission of design changes to contractors, in view of ensuring safety, health and social requirements of domestic construction sites are fulfilled.

Key Words: Roles and Responsibilities, Project Participants, Risk Mitigation

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CHAPTER 1

INTRODUCTION

1.1 Introduction

Safety, health and environment issues are becoming more important as a society progresses. This is particularly so for a country like Malaysia which is fast developing. Over the years, most researchers have readily demonstrated in majority of their researches which examined that violations of safety, health and environmental issues at construction sites correlated to consistent high number of accidents globally. However, many of them to date have unforeseen the influence of roles and responsibilities of every project participants from various disciplines could mitigate the casualties from happening on domestic construction sites.

1.2 Problem Statement

Statistics of occupational accidents by sector in year of 2009, 2010 and 2011 (Refer to Appendix A) derived from Department of Occupational Safety and Health Malaysia (DOSH) shown that construction industry among the highest sectors or

fields reported with investigated job site casualties over the recent years. These statistics clearly depicted that occupational accidents caused by manufacturing sectors easily overwhelmed construction industry, but seriousness of casualties related to construction sites that reported with 71, 66 and 51 cases of death has continuously soared passed manufacturing sector of 63, 59 and 45 reported loss of life for the year of 2009, 2010 and 2011 respectively.

Likewise according to the Social Security Organisation (SOCSO), government has reportedly given a hefty sum of estimating RM 1.6 billion as compensation for construction industry accidents in 2010, a staggering of 23 percent increased from RM 1.3 billion paid in 2009. The number of reported construction site accidents for the same period on the other hand has increased by 4.7 percent from 55,000 cases in 2009 to 57,637 cases in 2010. For the year of 2011, compensation amount further spiked to about RM 1.7 billion payable to a total of 59,894 reported construction site accidents as shown in Appendix B.

Evidently, non-compliance with safety, health and environmental requirements not only results in serious injuries or health concerns to the workers and public, but also leading to environmental degradation – both financially and damaging the reputation of industry.

Despite the fact that such statistics which suggested that construction sites has an unenviable safety record, unfortunately or more saddening is that, majority of the stakeholders and project participants – from top to bottom of the hierarchy levels are having a rather apathetic attitude towards safety precautionary measures at their respective construction sites throughout the project life cycle – from conceptual and planning stage until completion. Such situation well reflecting our current domestic construction sites are really at the bottom of barrel when it comes to effort of improving safety performance.

The main challenge now is how to integrate the collaborative efforts of different project participants from the hierarchy levels, to set aside priority of maximizing only their respective objectives out of the projects but also to reinstate the good reputation of construction industry by reinforcing the overall safety performance during the project life-cycle to in order to achieve a quantum leap towards formulating a more conducive working conditions and environments.

It is therefore important for construction players to take the initiatives and change the attitudinal aspects of poor safety culture at construction sites in order to eventually contribute to the growth of our nation.

1.3 Aim

The aim of this research is to study the influence of project participants in promoting workplace safety on domestic construction sites.

1.4 Research Objectives

To achieve the above mentioned aim the following objectives have been formulated;

- (i) To identify the roles and responsibilities of project participants in terms of safety and health on domestic construction sites.
- (ii) To study the influence of project participants towards risk mitigation for injury on construction sites.
- (iii) To make suggestions in improving workplace safety on domestic construction sites.

1.5 Research Methodology

The research methodology which is divided into three phases has been adopted to fulfill the objectives of this study (Refer to Figure 1.1). Related tasks have been identified and carried out through the phases as shown in Figure 1.1.

1.5.1 Phase 1

Initially an overview on roles and responsibilities of project participants, reviewing the definition of construction risk management and risk mitigation as well as identifying project participants in construction industry will be implemented through reviewing the information or works obtained from secondary sources such as journals, books, website and articles about the research title. A further discussion includes problem statement, aim of study, research objectives will also be conducted to gain better knowledge of important elements of this study.

1.5.2 Phase 2

During this phase, area of study which limited to the roles and responsibilities of project participants will be decided and research conduct coverage will also be limited to domestic private construction sites in Kuala Lumpur and Selangor. Unstructured interview with three experienced professionals in the industry were also done to identify the ideal sample of population and development of questionnaires for this study. Once confirmed, a survey will be carried out based on these questionnaires and data collected would subsequently be analyzed.

1.5.3 Phase 3

Information and data analysis on the collected results in phase 1 and phase 2, will serve as the basis to formulate conclusions and recommendations for this study. As such detailed recommendations as listed in Chapter 5 are concluded to coincide with three of the objectives as set-out in Chapter 1, sub-topic 1.4 Research Objectives.

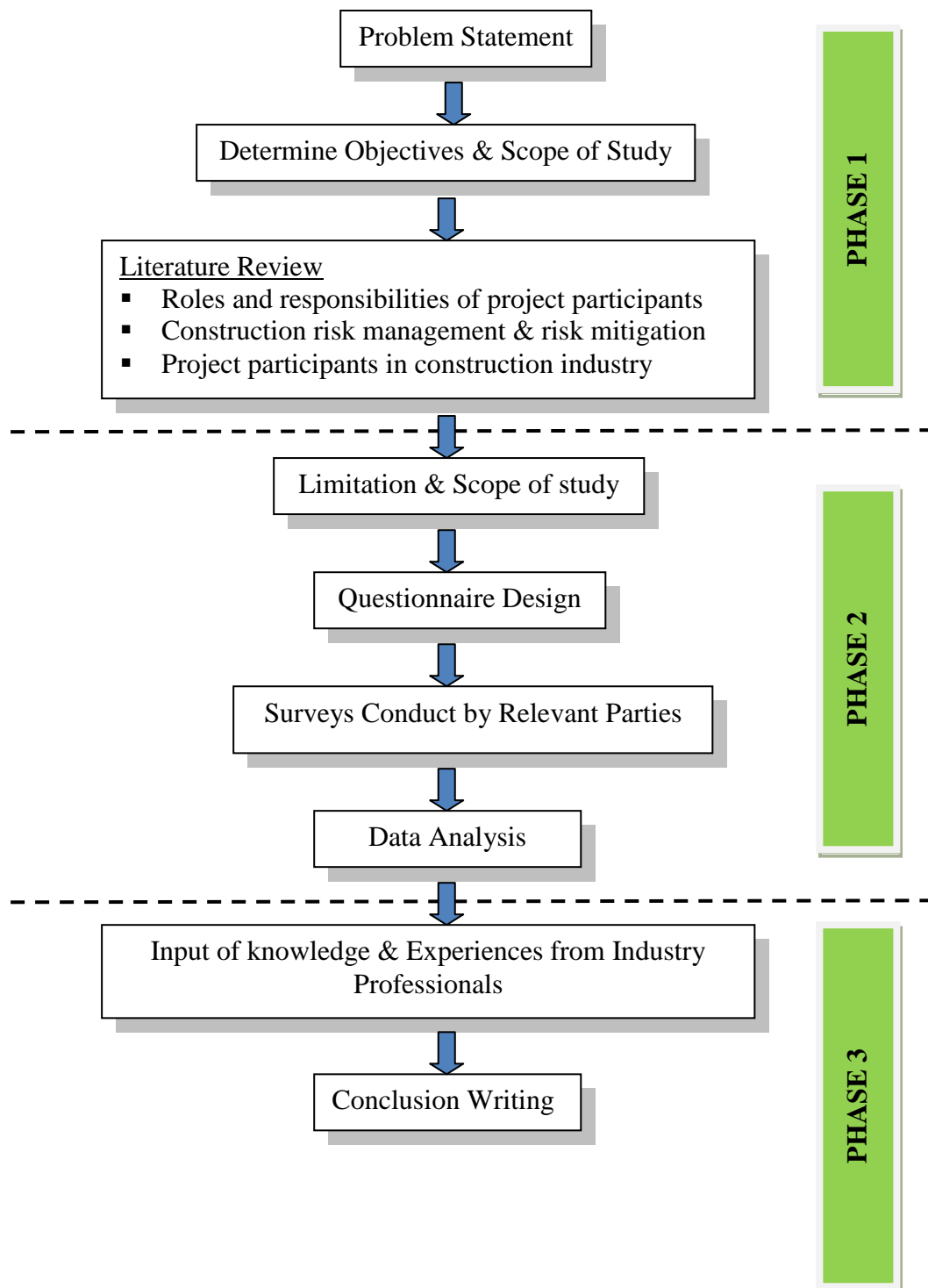


Figure 1.1: Methodology of research study

1.6 Limitation and Scope of Study

The selected area for study in this research is mainly limited to the roles and responsibilities of project participants in the order of hierarchy levels, as the risk mitigation to Safety and Health's casualties. Specifically, the research conducted will only be limited to domestic private construction sites in Kuala Lumpur and Selangor.

REFERENCES

- Abdul Majid, M. Z. & McCaffer, R. (1998). Factors of non-excusable delays that influence contractors' performance. *Journal of Management in Engineering*, ASCE, p. 42-45.
- Claudia, A., Lusi, L. G., & Rens, V. M. (2008). Technologies of Risk, and the Political: Guest Editors' Introduction. *Security Dialogue* 39, p. 147-154.
- Construction Industry Development Board. (2007). *Strategic Recommendations for Improving Environmental Practises in Construction Industry*, Malaysia.
- Department of Occupational Safety and Health. (2012). *Electronic references*. Retrieved May 10, 2012, from <http://www.dosh.gov.my/doshv2>
- Department of Occupational Safety and Health Ministry of Human Resource. (2008). *Guidelines for Hazard Identification, Risk Assessment and Risk Control*. Malaysia.
- Department of the Environment, Transport and the Regions (1997), *Mitigation Measures in Environmental Statements*, London.
- Heckerman, D., Mamdani, A., & Wellman, M. P. (1995). Real-world applications of Bayesian networks. *Communications of the ACM*, 38(3), 24–26.
- Laura, M. C., Victor, M. G., Carlos, A., & Santiago, J. J. (2008). Managing the Risks of Risk Management. *Journal of Decision Systems*, p. 501-521.

- Lee, E. C., Park, Y. T., & Jong G. S. (2008). Large engineering project risk management using a Bayesian belief network. *Expert systems with applications*, p. 5880-5887.
- Loosemore, M. (1999). Responsibility, power and construction conflict. *Construction Management and Economics*, p. 699-709.
- Naoum, S., G. (2007), Dissertation research and writing for construction students. *Second Edition Butterworth-Heinemann, Oxford*.
- Pertubuhan Keselamatan Sosial (2012, March 3). 59,000 Kemalangan tempat kerja. *Sinar Harian*.
- Ranjit, K. (2005). Research Methodology: A step-by-step guide for beginners. *Second Edition*.
- Ross, M. (2001). Application of mitigation and its resolution within environmental impact assessment: an industrial perspective. *Impact Assessment and Project Appraisal*, p. 195-204.
- Robens Committee. (1972). Committee on Safety and Health at Work, Safety and Health at Work: Report of the Committee. *HMSO*. London paras 28 and 41.
- Wang, S. Q., Mohammed, F. D., & Muhammad, Y. A. (2004). Risk management framework for construction projects in developing countries. *Construction Management and Economics*, p. 237-252.